DOCUMENT RESUME

ED 253 642 UD 024 093

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TITLE Relationships of Social Background to Classroom Experience and Academic Abilities: A Model for Academic Development.
PUB DATE Feb 85
NOTE 32p.; Paper presented at the Eastern Educational Research Association Conference (Virginia Beach, VA, February 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Ability; *Academic Achievement; *Affective Behavior; Basic Skills; Classroom Environment; Cognitive Development; Cultural Background; Elementary Secondary Education; Interpersonal Competence; Models; Sex Differences; *Social Background; Social Differences; Socialization

ABSTRACT

This study delineates the relationships between social background, classroom experience, and academic abilities. Classroom experience is mainly judged in terms of students' affective dispositions. The objective is to clarify how these dispositions are shaped by the personal and situational factors in a child's social background, and then how they, in turn, shape academic achievement. Two types of affective dispositions are considered: first, a student's inclination or ability to apply himself/herself to the classroom tasks; second, a student's ability to get along with the teacher and classmates. In the first stage of the analysis, these characteristics are specifically related to a student's gender, ethnic membership, his/her neighborhood socioeconomic status, and the type of school (public or private) he/she attends. In the second stage of the inquiry, these socio-personal attributes, along with the affective dispositions and previous academic performance, are used to predict achievement in vocabulary, reading comprehension, computation, and problem-solving. An effort is made to integrate all these variables into a canonical model of adjustment to school. (Author/RDN)

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Relationships of Social Background to Classroom Experience and Academic Abilities:

A Model for Academic Development

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Eastern Educational Research Association Conference
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February 1985

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UD 024 093

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ABSTRACT

This study delineates the relationships between social background, classroom experience, and academic abilities. Classroom experience is mainly judged in terms of students' affective dispositions. Our objective is to clarify how they are shaped by the personal and situational factors in a child's social background, and then how they, in turn, shape academic achievement. Two types of affective dispositions are considered: first, a student's inclination or ability to apply himself/herself to the classroom tasks; second, a student's capability to get along with the teacher and classmates. In the first stage of the analysis, these characteristics are specifically related to students gender, ethnic membership, his/her neighborhood socio-economic status, and the type of school (public or private) he/she attends. In the second stage of our inquiry, these socio-personal attributes, along with the affective dispositions and previous academic performance are used to predict achievement in vocabulary, reading comprehension, computation, and problem-solving. An effort is made to integrate all these variables into a canonical model of adjustment to school.

Introduction

Educational research, as a scientific endeavor, is coming of age. According to Khun (1963), one of the surest signs of maturation in a field of normal science is the emergence of paradigms that reflect a consensus of scientific evidence, provide guidance for the interpretation of new findings, and stimulate discovery. Recently, a number of paradigms have been proposed by educational researchers aiming at improving school effectiveness. For instance, Bloom (1976) has developed a model based on the learner's history, for explaining academic skill mastery. Walberg (1981, 1984) has also offered a model centered around instructional intensity, for understanding differences in school productivity. Although these models are not presented by their authors as competing paradigms, they have not been fully integrated. More importantly, their compatibility or articulation with other paradigms advanced, for example, in psychology and sociology has not been systematically worked out. This is the task undertaken in this paper. Espousing the general approach known as confluent education, we attempt to interface the school learning paradigms with two other models: one, sociological, that focuses on the ascribed rather than the achieved characteristics of the learners; the other, psychological, that situates academic achievement within the larger structure of the intellect. Once that general model is outlined, attention is turned to the relationships between social background, various aspects of classroom experience, and academic development. Specifically, our objective is to clarify how cognitive strength and affective dispositions toward schooling are shaped by personal and situational factors in a child's social background; then, we will examine how much they, in turn, contribute to academic performance.

Theoretical Perspective

A. Understanding Classroom Experience

The basic premise of our inquiry is that schools have two major functions: one is to impart literacy, the other is to socialize children for future social roles and status (Bloom, 1981; Madhere, 1981). Based on that view, the interpersonal dynamics of the classroom experience is as worthy of interest as academic learning. The cognitive component, however, has traditionally been the dominant pole of the tandem. Consequently, in most studies, the tendency has been to present the interpersonal or affective dimension as simply a correlate of school orientation or climate (Flanders, 1959). This vicarious role, however, was soon seen as too limited. As researchers began to deepen their understanding of classroom dynamics to include motivation (Bruner, 1966), social interaction (Schmuck and Schmuck 1979), learned helplessness (Willow and Butowsky, 1980), it was shown that affective dispositions are of cardinal significance to overall academic achievement. For instance, Hurst (1980) has found that the two domains were interrelated, when she tested the importance of each for an individualized learning task. Bret (1978) demonstrated the beneficial effects of 'circle activities' on reading readiness. Condon (1978) gathered from several studies evidence of a relationship between affective measures and reading comprehension.

A meta-analysis of the various empirical findings suggests that school related affective dispositions cluster into two subsets. Indeed, in one perspective the emphasis seems to be on students' psychological needs, mainly the nurturance of each child's social being as a precondition for meaningful learning. That perspective is rooted in the work of Maslow (1962), Buhler (1971), Heath (1972), among others. There is also a second side of the issue that is evident in the writings of Krathwol and Bloom (1964), and that has

been more recently elaborated upon by Flavell (1977, 1978, 1979).

That author has postulated that in mastering any given task, a student needs a repertoire of strategies which he labeled metacognitions. These variables encompass an extensive category of conscious monitoring processes, including attention, perception, and listening. The metacognitive factor reflects a student's motivation to learn and to apply himself/herself to the classroom tasks. The socio-emotional factor reflects the student's interest in or ability for nurturing friendly relationships with the teacher and with fellow pupils. These are the affective behaviors that a child brings with him/her to the classroom, and the teacher has to manage them in order for learning to take place.

The latter propositions constitutes a significant part of Bloom's model for explaining variations in learning outcomes. Since Bloom's work is widely known, only a brief summary of his theory is presented here to facilitate subsequent discussion. His three major tenets are: a) given the appropriate conditions, every student can learn almost everything the school has to offer, therefore, differences in academic performance can be reduced to a minimum; b) these appropriate conditions are best achieved through mastery learning strategies; c) mastery strategies are effective because they take into account each learner's history, i.e., the cognitive and affective characteristics he/she brings to the task.

Graphically represented, the principles outlined above lead to the model below. It simply states that "variations in the cognitive entry behaviors, the affective entry behaviors, and the quality of instruction will determine the nature of the learning outcomes" (Bloom, 1976 p. 11).

[Insert Figure 1 here]

Bloom's model provides a useful framework for understanding the relation-

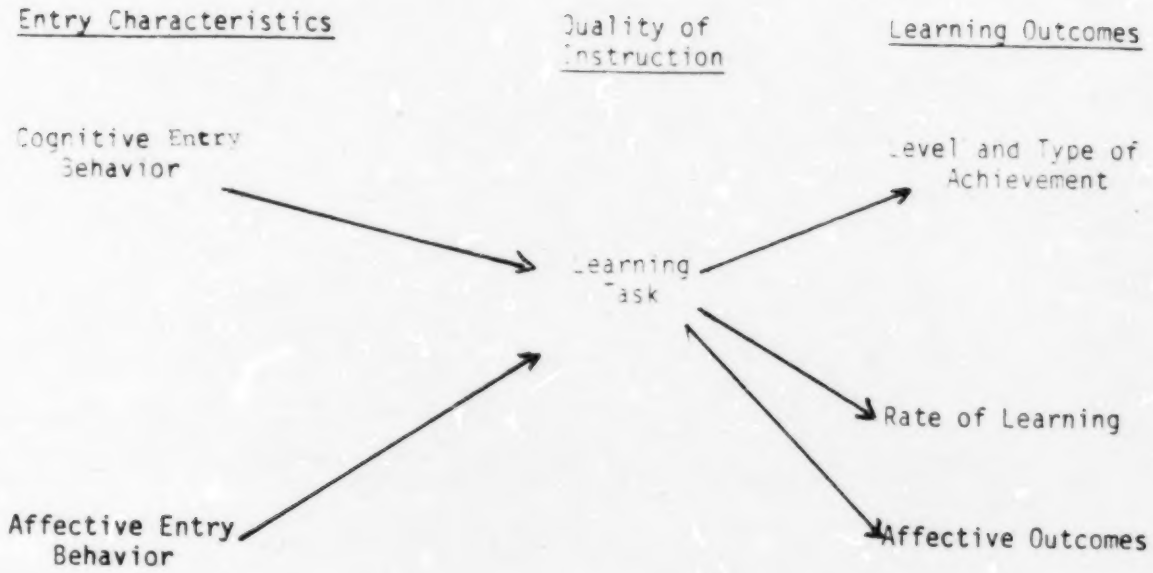

Figure 1: Relationship Between Entry Behaviors and Learning Outcomes (Bloom's Model)

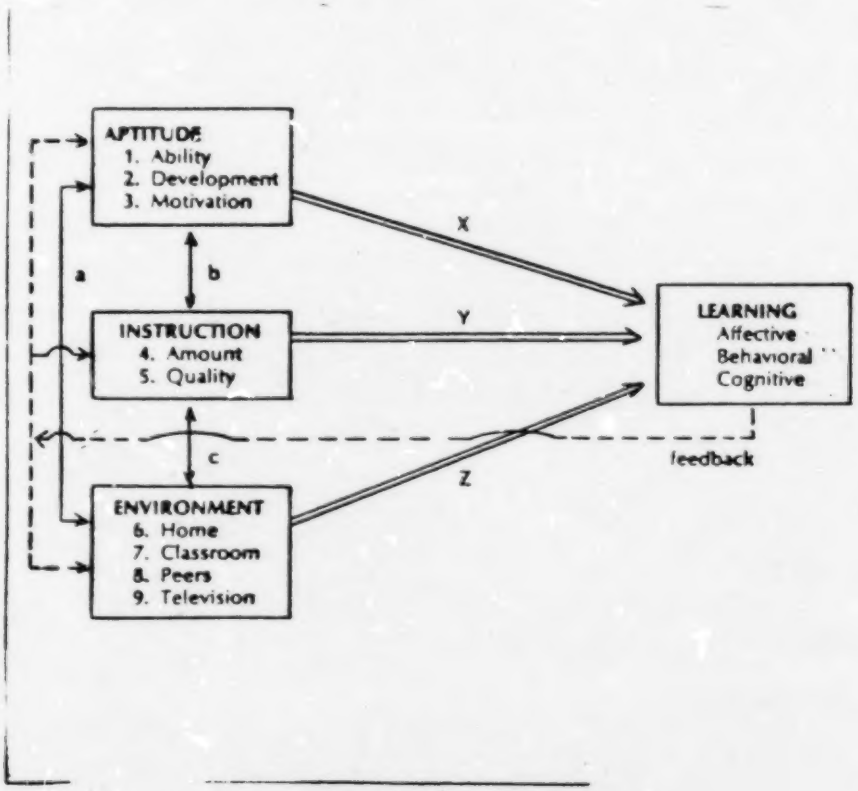

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Figure 2: Causal Influence on Student Learning (Walberg's model)

ships between cognitive and affective behaviors. However, it is limited in the sense that it presents school learning as a self-contained activity, a close loop; it ignores the findings from sociology of education regarding the saliency of out-of-school factors in the determination of achievement.

Many authors, working in the same tradition as Bloom, have come to recognize that academic development cannot take place without a structured out-of-school support system. Dave (1963), is one of the early proponents of this viewpoint. But, it is Walberg who recently attempted to integrate the research evidence into a larger model of academic achievement.

In developing his model of school productivity, Walberg (1981, 1983, 1984) structures it around three notions: a) Practically all differences in educational outcomes can be explained in terms of differences in educational irvestments. b) A great deal of educational investments take place outside of the classroom. c) The optimal way to bring about educational progress is to consider the various investments in combination and not in isolation, because no single variable is sufficient to determine achievement.

Following an inventory of the leading investment indices, Walberg retains nine critical ones and groups them into three major factors: a factor of personal aptitude, a factor of instructional management, and an environmental factor. "The major causal influences flow from aptitudes, instruction, and the psychological environment to learning. In addition, these factors influence one another, and are influenced in turn by how much students learn" (Walberg, 1984, p 21). The model is reproduced in Figure 2.

[Insert Figure 2 about here]

This model has much to recommend it. However, as Walberg himself admits, it is rather reductionist: its account of external influences on classroom experience does not go beyond a description of peer group and home interactions. These interactions are somehow expected to explain away the impact of socio-economic forces upon schooling. The exclusion of the larger social factors is justified on the ground that they are not easily alterable. But, aptitudes either are not easily alterable (see Bloom); yet, they have found their place in Walberg's model of school learning. And they belong there.

B. Social Antecedents of Schooling

Quite understandably, the strictly academic explanation for achievement has been challenged by a number of investigators interested in the sociology of schooling. These researchers adopt a macro-social approach to the learning process, and hold the view that the school is a socialization agent. Socialization is defined as "the combination of cognitive learning with the internalization of values and customs (that insures) the process of social continuity" (Parkin, 1978, p. 604). As a microcosm of the larger society, the school reflects or even reinforces the general stratification system. So an alternative explanation of achievement differentials can be offered in terms of differences in learner's status.

The early works in that vein pointed to the saliency of socio-economic status as a determinant of academic success measured either on standardized tests or as the number of school years completed (Bowles and Gintis, 1976; Coleman, 1966; Plowden Report, 1967). But lately, it has been recognized that "there are multiple axes of stratification in the United States, (and though) they are not equal in influence or prominence," each one bears differently upon the quality of the classroom experience (Persell, 1977, p. 16; Phillips,

1981). The first axis of stratification, highly connected with economic status, has to do with some situational factors, namely the residential/school attendance area and the type of school (public or private) a child goes to. As noted by Persell (1977), "American children are educated in spatially distinct settings, including public and private schools and the differently organized neighborhood schools" (p. 33). The other major axis of stratification pertains to students' ascribed or personal characteristics such as ethnicity and gender (Parelius and Parelius, 1978; Ogbu, 1977). That second axis, it has been suggested, might even be displacing the first one (class) as the principal line of social cleavage (Glazer and Moynihan, cited by Parkin, 1978).

The different poles of stratification help define various student clienteles, which attend schools that are qualitatively different; whence the variations in achievement. But, it is further pointed out, while the recurring differences among the various student clienteles are quite predictable, the relationship between a particular status and educational accomplishment "varies strikingly according to what measure of educational success is being used. For instance, the pattern for gender differs considerably from those observed for socio-economic and ethnic variables" (Parelius and Parelius, 1978, p. 287).

This findings leads one to pay attention not only to the level, but also the type of educational performance. Unfortunately, the macro-social theorists of schooling are not very explicit about the various types of cognitive skills being developed in the classroom. So, one has to look elsewhere for some understanding.

C. School Learning and Intellectual Repertoire

The most detailed analysis of intellectual ability in general and school

learning in particular has been offered by Guilford. In studying the acquisition of knowledge, Guilford (1967) distinguishes three aspects: a) the content of the information to be learned; b) the elements or products to be learned; c) the intellectual operations performed by the learner. There are four types of content: — semantic, symbolic, figural, and behavioral. There are five types of operations: memory, cognition, convergent production, divergent production, and evaluation. There are six types of products: units, class, relation, system, transformation, and implication. By interfacing these three major dimensions and their components, one can readily identify 120 possible intellectual skills. The structure of intellect model is reproduced in Figure 3.

[Insert Figure 3 about here]

It is not necessary to get into a detailed discussion of each component of the model. Our intent is simply to show its usefulness for understanding the scope and limitation of academic learning. First, as far as content is concerned, academic learning deals mostly and openly with semantic and symbolic information, and only in an indirect way with figural and behavioral material. Concerning the intellectual operations, there have been recently increased efforts in the school to tap most of them, although memory and cognition remain the dominant modalities. When it comes to products, the focus is mainly on units, classes, and relations; familiarity with logical systems, transformation and implications is not developed and tested, at least until the secondary or even post-secondary level.

Four of the principal measures of achievement, in elementary school, are vocabulary, reading comprehension, computation, and numerical problem-solving. Though often lumped together as the basic skills, each of them is underlied by a different type of intellectual ability. In Guilford's terminology,

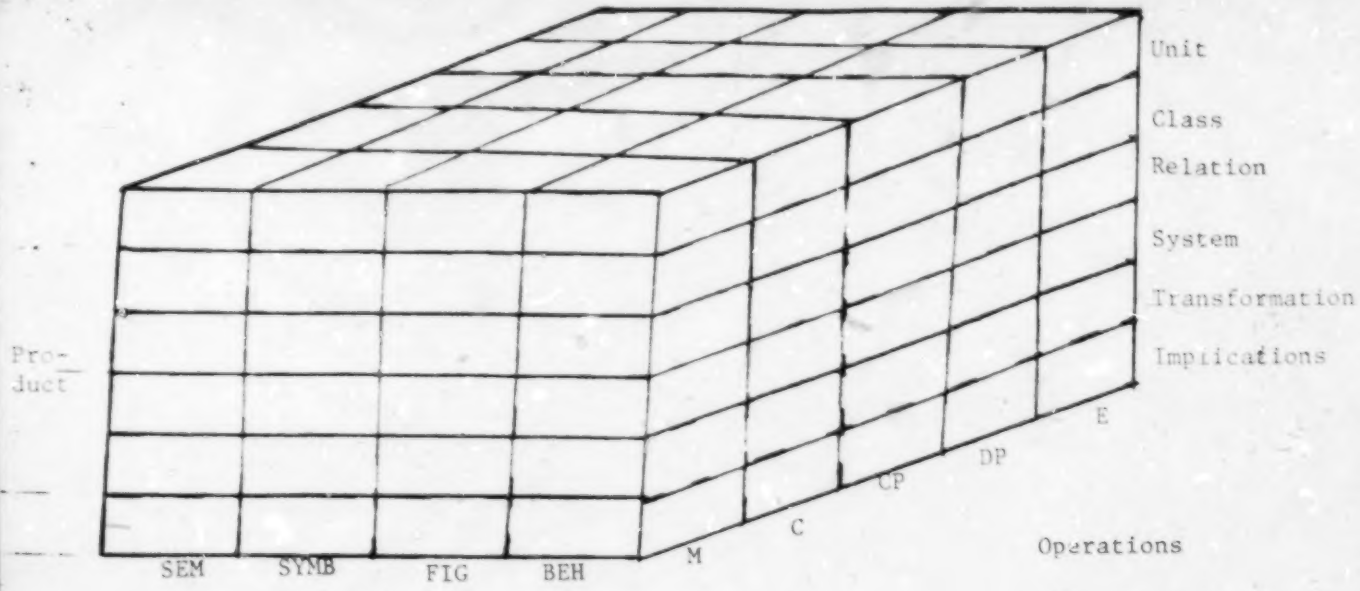

Figure 3: Structure of Intellect (Guilford's model)

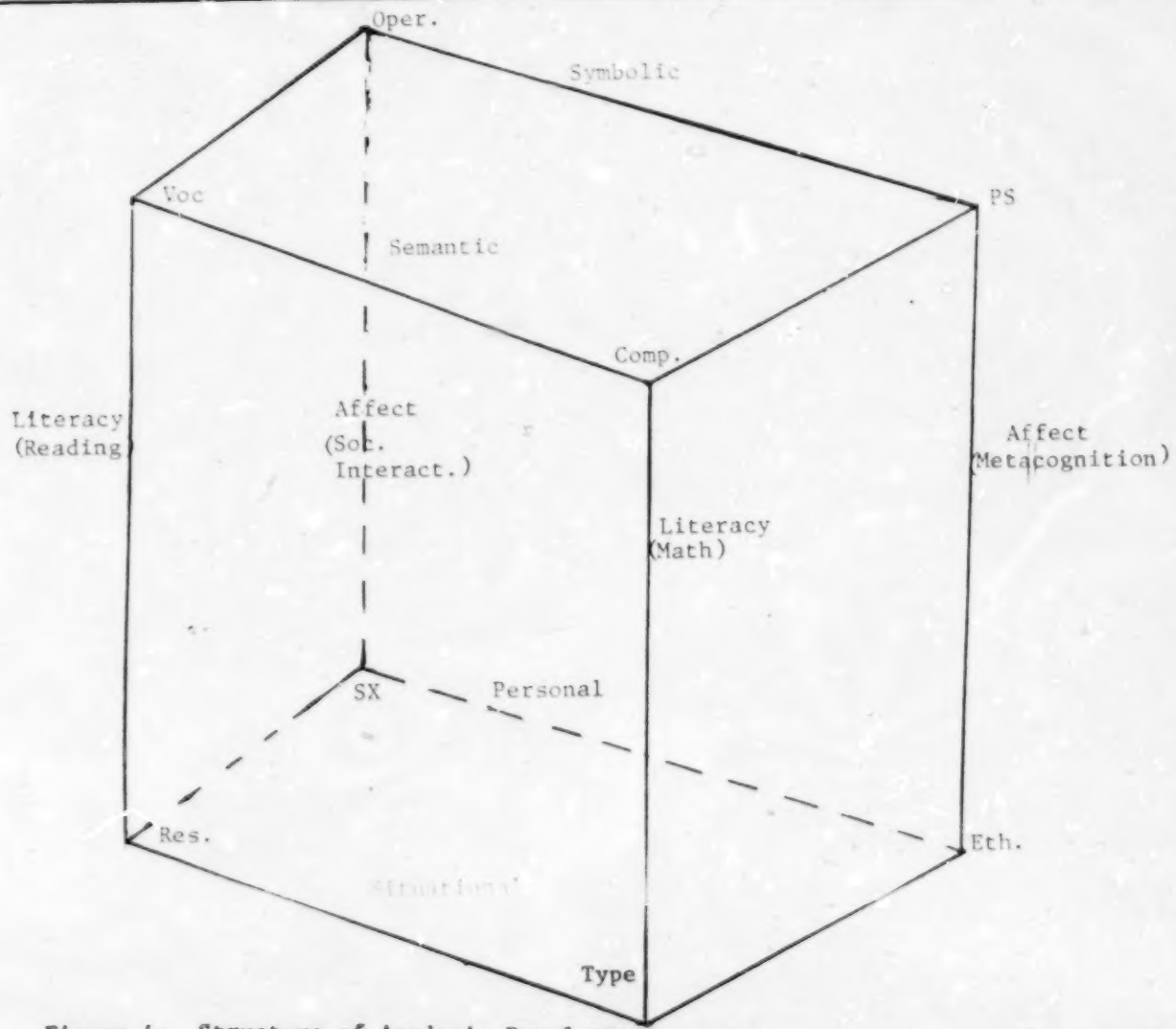

Figure 4: Structure of Academic Development

vocabulary illustrates the cognition of semantic units; arithmetic computation can be described as memory of symbolic relations, reading comprehension as evaluation of a semantic system, and numerical problem solving as convergent production of symbolic implications.

D. Model Articulation

From the various lines of inquiry explored thus far, it is possible to piece together a fairly comprehensive model of academic development. That model may be structured around six major factors: a situational factor and a socio-personal factor representing the social background of the learners; a literacy factor, and a behavioral factor defining the degree of adjustment to school; a semantic factor and a symbolic factor accounting for the level of academic competence. From a measurement point of view, each factor may be represented by more than one variable. From an educational point of view, the model rests on the three following premises: a) To obtain a complete understanding of academic development, one must consider not only the interpersonal differences, but also the intrapersonal variations in achievement across various subject matters. b) The degree of adjustment to school, what Bloom calls the cognitive and affective entry behaviors is a necessary, but insufficient factor to explain variations in learning outcomes. c) Differences in students' social background represent a significant influence on both their adjustment to school and their academic competence. The model can be graphically represented in a three-dimensional space as follows.

[Insert Figure 4 about here]

On the basis of this larger model, two major research questions have been formulated:

1. To what extent do learning outcomes reflect the social and personal background of students as opposed to their affective and cognitive entry behaviors?

2. Are there any significant differences between the metacognitive and socio-emotional components of the affective domain in their impact on learning outcomes?

Each of these questions subsumes a number of related points that will also be examined.

Method

Five public schools and four parochial schools were initially selected to represent the entire socioeconomic spectrum of a large urban school district. Students in grades 3 through 8 were randomly selected from a population of Chapter I participants. The sample included 141 subjects. Seventy-seven percent were from very poor neighborhoods, and 23 percent from relatively more affluent communities. Seventy-six percent attended public schools, while 24 percent were enrolled in parochial schools. Thirty-five percent were bilingual/bicultural students (Hispanic, Italian, and Portuguese), the remaining 65 percent were monocultural. Finally, 52 percent of the sample were males as compared to 48 percent being females. This sample was further divided into two subgroups: one representing the primary grade level (3 through 5), the other representing the intermediate grade level (6 through 8).

Four sets of variables were considered for this investigation: 1) The learning outcomes, or academic competence, were measured by subtests of reading vocabulary, comprehension (semantic factor), computation and problem-solving (symbolic factor) on the Comprehensive Tests of Basic Skills (1981 edition). 2) Student previous achievement in reading and math (literacy factor) was assessed on the Metropolitan Achievement Test (1970 edition). 3) Two pairs of indices representing the metacognitive and socio-emotional aspects of affectivity were obtained at the point of entry (in the fall) from the teacher of each student, on a 5-point scale. 4) Demongraphic information

on gender and ethnicity (personal factor) as well as residential area and type of school (situational factor) was gathered on each participant. All the achievement measures were transformed into normal curve equivalents (NCE) to facilitate grade-to-grade comparisons. The situational and personal background variables were dummy coded for the analysis.

Three sets of canonical analyses were performed. First, previous achievement and the affective behaviors were used to predict overall performance in vocabulary, reading comprehension, computation, and problem-solving. Then, the four social antecedent variables were introduced in the above equation in order to determine the relative contribution of each set of predictors to the variance in learning outcomes. Finally, the equation was again modified by excluding the latter variables: the social background measures were related only to the scores for cognitive and affective behavior in an effort to clarify the relationship between learners' status and school adjustment. The various analyses were carried separately for students at the primary grade level and for those at the intermediate grade level, in order to detect any developmental trend in school adjustment and academic competence.

Results

The means and standard deviations on all the variables entering the model are reported in Table 1 for the two subsamples.

1. Results of the canonical procedure relating the four learning outcomes to the two measures of previous achievement and the two indices of affective behavior are presented in Table 2.

a) The first column of data is for the primary grade group. Based on the value of Wilk's lambda, one can see that 54 percent (1 - .456) of the variance in the criteria is predictable from the first set of variables. The greatest proportion of that variance can be attributed to two underlying

functions for which the level of significance is .04 or less. The eigenvalue indicative of the percentage of variance explained by the first function alone is equal to .377 (canonical R = .614); the second function, with a canonical correlation of .506, explains more than 25 percent of the remaining common variance. For the first function, the most important contributor is arithmetic computation, with a .94 loading; the least differentiating criterion is affiliation for which the canonical weight is only .-04. For the second function, the most significant contribution is given by the two measures of previous achievement for which the loadings are above .95; the affective measures carry little weight on that function. Based on the strength and the sign of the various loadings, one can identify four clusters of variables: computation and metacognition seem to be closely associated; so are vocabulary and previous reading achievement; problem-solving go together with previous math performance; so does reading comprehension and affiliation.

b) The second column of data is for the subsample at the intermediate grade level. Based on the value of Wilk's lambda, one can see that the set of criterion variables share about 40 percent (1 - .596) of its total variance with the predictor set. The greatest proportion of that total variance can again be attributed to two underlying functions for which the level of significance is .02 or less. The eigenvalue corresponding to the first function is equal to .225 (canonical R = .474); approximately 19 percent of the additional common variance is picked up by the second function with a canonical correlation of .436. For the first function, the most significant contributors are pre-reading, pre-math, and computation which all take loadings above .80; on the second dimension, the outstanding variable is metacognition, with a canonical weight of .99. The strength and sign of the loadings suggest only three clusters of variables: vocabulary and reading comprehension stand in close proximity to previous reading achievement and

metacognition; computation may be well predicted from previous math performance; finally, problem-solving and affiliation seem to occupy the same space.

2. Results of the canonical procedure relating the four learning outcomes not only to the cognitive and affective measures, but also to the social background variables are presented in Table 3.

a) The first column of data is for the subgroup at the primary grade level. Based on the value of Wilk's lambda, one can see that 70 percent (1 - .297) of the total variance in the criterion set is predictable from the first set of variables. The greatest proportion of that total variance can be attributed to only one underlying function which is significant at the .001 level. The eigenvalue indicative of the percentage of variance explained by that function alone is equal to .485, (canonical R = .697). Among the variables in the predictor set, the most significant is previous math performance (-.52), closely followed by ethnicity; the least critical predictors are gender and affiliation, for which the canonical weights barely exceed .10. Among the variables in the criterion set, the highest loading is obtained for computation (-.92). Overall, based on the sign pattern, one can identify two clusters of variables: one that reflects the association of the two numerical variables with previous math achievement and metacognition; the other that indicates the dependency of vocabulary and reading comprehension on previous reading skills, affiliation, and most of the social background variables.

b) The second column of data is for the subgroup at the intermediate grade level. Based on the value of Wilk's lambda, one can see that the set of criterion variables share about 62 percent (1 - .374) of its total variance with the predictor set. The greatest proportion of that common

variance can be attributed to two underlying functions for which the significance level is .01 or less. The eigenvalue corresponding to the first function is equal to .372 (canonical R=.61); close to 30 percent of the additional common variance is accounted for through the second function, with a canonical correlation of .547. The greatest contribution to the first function is provided by the criterion variables computation and reading comprehension (above .7) On the second dimension, the highest loading of .96 is shown by previous achievement in reading; the variable affiliation is of limited significance to either factor. Based on the various loadings and the sign pattern, one can sketch out four clusters of variables: vocabulary seems to be strongly associated with previous performance in reading; computation goes along with previous math achievement and gender; problem-solving and school type have similar coordinates; a final cluster includes reading comprehension, metagcognition, ethnicity, and residence.

3. Results of the canonical procedure relating the school adjustment variables, i.e., the cognitive and affective variables, to the indices for social background are presented in Table 4.

a) The first column of data is for the subgroup at the primary grade level. Based on the value of Wilk's lambda, one can see that 54 percent (1 - .461) of the total variance in the criterion set is predictable from the first set of variables. The greatest proportion of that total variance is attributable to two underlying functions for which the significance level is .02 or less. The eigenvalue, indicative of the percentage of variance accounted for by the first function, is equal to .349 (canonical R = .591); the second function, with a canonical correlation of .440, explains more than 19 percent of the remaining common variance. The salient variable on the first dimension is ethnicity, with a loading of .88. On the second factor,

the greatest contribution is made by affiliation (.96) and residence area (-.88). In light of the strength and the direction of the canonical weights, only two clusters of variables can be clearly identified: one that shows the relationship of previous reading performance to school type, the other that reflect the association between metacognition and residence.

b) The second column of data is for the subsample at the intermediate grade level. Based on the value of Wilk's lambda, one can see that 34 percent (1 - .66) of the variance in the criterion set can be predicted from the social background measures. The greatest proportion of that total variance can be attributed to only one underlying factor for which the level of significance is .015. The eigenvalue corresponding to that function is equal to .207 (canonical R = .455). Three variables take on moderately high loadings on that dimension: gender (.72), residence (.62), and affiliation (.62).

Discussion

The preceding analysis helps us gain some new understanding about four issues: a) the process by which social background influences both adjustment to school and academic performance; b) the interdependency of basic skills and thinking skills; c) the place of affectivity in the total school experience; d) the interaction of a developmental factor with social background and classroom experience.

1. Influence of Social Background

The first step in our analysis conforms to Bloom's model for explaining learning outcomes. The second step is more in line with the extended framework proposed here, that brings four social background variables into the prediction equation. From one step to the other, the net change in the value of Wilk's lambda is definite evidence that situational and personal variables

significantly influence various measures of academic competence. The impact of these social antecedents improve by 30 percent to 55 percent the accuracy of the prediction. However, these variables seem to exercise their influence for the most part through the school adjustment channels. Indeed, we observe that a) no new canonical function emerges as they are juxtaposed to the measures of cognitive and affective behaviors in the equation; b) when the interrelations among the predictors alone are studied (step 3 in the analysis), the amount of common variance ranges from 21 percent to 48 percent. So, there is clearly a great degree of convergence between social background and classroom experience.

One reason why the social antecedent variables may not have generated an independent factor is that their respective contribution might be unique rather than general or common to all aspects of academic development. In other words, each one may help differentiate among specific learning abilities. For instance, reading comprehension seems to be more consistently associated with social background than is math, or the metacognitive skills tend to go more systematically with residence (which reflects most directly economic status) than it does with any other social variable. That pattern corroborates the suggestion made by Parelius and Parelius (1978) that "the relationship between educational accomplishment and (social variables) varies strikingly according to what measure of educational success is being used" (p. 287).

In light of the contrastive evidence presented above, one may conclude that the cognitive and affective entry behaviors remain the dominant factor in determining learning outcomes, but the social background of the learners plays also a critical, if secondary, role in academic development.

2. Interdependency Between Basic Skills and Thinking Skills

In most of the analyses involving the learning outcomes, two canonical functions emerge as statistically significant. Based on the sign patterns, one can see that one of these functions represent the content of the learning tasks, contrasting the verbal or semantic skills (reading, vocabulary, and comprehension) with the numerical or symbolic skills (computation and problem-solving). The other dimension seems to account for tne complexity of the tasks, with vocabulary and computation appearing at one end of the spectrum, comprehension and/or problem-solving at the other. The content dimension is the more stable of the two, in the sense that it is clearly identifiable and that the pattern of variable clustering remains the same from stage to stage of the analysis. However, it is not necessarily the most powerful or discriminating function, since it is often second to the task complexity factor, and tends to account for less variance than the latter. On the other hand, task complexity, when significant, captures the greater share of common variance; one may say that it is more sensitive to the variations in both social background and educational accomplishment. Our understanding of the nature of this dimension can be advanced by more closely rapproaching it to what Guilford called the products of information. In that light, one can see that, in some cases, the contrast along the complexity dimension is between units and relations as opposed to systems of information (vocabulary and computation versus comprehension); in other cases, the contrast is between these products and one of higher order implications (problem-solving). Such variations in the clustering of variables can be partly understood from a developmental perspective, as we will see later on. For the time being, it suffices to note that these four learning outcomes, which are customarily referred to as basic skills, are rich in complexity. Basic skills and higher-

order (thinking) skills are actually inseparable. To put it in very simple terms, thinking is always thinking about something. One way of enriching thinking is to make explicit the various products of information (units, classes, relations, etc.). A great deal of emphasis has been put rather on thinking processes or operations such as cognition versus evaluation. These findings are a reminder that there is another approach that may be more readily congruent with whatever level of instruction.

3. Role of Affectivity

Two indices of affective behavior are part of the analysis. One called metacognition, represents a student's inclination to apply himself/herself to the classroom activities; the other named socio-emotional behavior or classroom interaction, refers to the child's ability to get along with the teacher and fellow pupils. Our findings indicate that these two related variables fit quite differently in the global school experience. When the focus is on learning outcomes, metacognition is the affective variable that carries the greater weight. It seems also to correlate better with previous achievement. It is from this angle that cognitive and affective behaviors tend to reinforce one another. These metacognitive skills may, to a large extent, measure the "engagement" of the learner in the task. Attending and listening define the student's ability to focus on pieces of instructional information. Obviously, the greater the degree of engagement, the greater the probability of mastering the task. The impact of the other affective variable, socio-emotional behavior or classroom interaction, on academic achievement is rather limited; its canonical weight never exceeds .21. But, it is evident that it is more sensitive to differences in social background than in metacognition. Indeed, when only the cognitive and affective measures are related to social antecedents, socio-emotional behavior shows canonical

loadings higher than those for metacognition. Furthermore, once the social background variables are introduced in the equation, the predictive power of classroom interaction on achievement is drastically altered. So, one may conclude that it is through classroom interactions or affiliation that social status finds its way into the classroom experience.

4. Developmental Perspective

Walberg (1984), in his study of school productivity, had recommended that (Piagetian) level of development be included in the prediction of achievement. Although not conforming totally to his model, the present investigation yields results that show the fruitfulness of his recommendation. Several points may be highlighted:

a) Looking at the relationship between achievement and the set of cognitive and affective behaviors - what Blooms calls the learner's history - one notices that more variance is explained at the primary grade level than at the intermediate grade level. But, when the social background variables are also included in the equation, more variance in achievement is accounted for at the intermediate grade level than at the primary grade level. In other words, the significance of strictly academic factors on learning diminishes while that of social factors increases as one moves up the grades. Such a trend suggests that schooling is not just a socializing process, it is, as argued by Layard and Psacharopoulons (1974), and Wolpin (1977), a screening agent, responsible not only for the accumulation, but also for the distribution of educational capital.

b) At the intermediate grade level, two canonical functions consistently emerge as significant. At the primary grade level, one or two functions appear to be necessary to account for the common variance, depending on the set of predictors being used. This leads to the following understanding: although differences in the thinking processes underlying academic performance

are already noticeable in the early grades, they are not crystallized until the upper elementary level.

c) The third point has been made earlier in our discussion, but is worth repeating here. It has to do with the factor of task complexity, when it is statistically significant. The factor contrasts knowledge of units and relations to that of information systems at the primary grade level. But, at the intermediate grade level, the canonical weight for vocabulary indicates that the knowledge of units of information is not very discriminating; the significant contrast is between relations and systems, on one hand, and implications on the other. In other words, the difference between concrete and abstract thinking reaches a new level during the preadolescence (Piaget's psychological thought meets Guilford's).

Conclusion

In closing, we would like to offer the following brief comments and recommendations:

1. One way of enriching both student thinking and basic skills instruction is to make explicit the various 'products of information' (units, classes, relations, systems, etc.) that the learner has to acquire. Such an approach to thinking, in contrast to many other approaches being tried, does not require the development of a new and separate curriculum. Thus, it may be more implementable.

2. Many people with an interest in confluent education tend to stress the social interactional aspect of affective behavior over the metacognitive skills. That emphasis may be misplaced. Our results indicate that while positive feelings among students and between teacher and pupils are important, they are not likely to have an immediate impact on achievement.

3. For students in need of remediation, the best way to manage test scores and other assessment data may not be by normative comparisons to other students, but through an individual profile. A profile makes visible the differential abilities of a student. Sizeable fluctuations in performance from one subject matter to the other are indicative of a need for a different instructional strategy for the particular student. This is the key to individualized instruction.

4. On a more general note, while the learner's history may be the necessary factor for explaining differences in level of competence, social background appears to be a necessary factor to account for differences in type of learning.

5. By using a population of students with a long history of academic difficulties, this study dealt with a limited ability range. Yet, it was possible to account for 50 percent or more of the total variance in achievement. This attests of the power of the explanatory model used. It is certainly a promising framework for obtaining a complete rather than fragmented picture of school experience.

Table 1

Descriptive Data on Twelve Variables Representing Social Backgroun, Previous Achievement, Affective Behaviors & Learning

Grade	Primary			Intermediate		
Stat. / Var.	Mean	S.D.	N	Mean	S.D.	N
Resid.	.62	.61	61	.89	.46	80
School	.96	.38	61	.78	.47	
Gender	.55	.50		.43	.52	
Ethnicity	.52	.50		.75	.43	
P/Read.	20.02	14.86		20.52	14.43	
P/Math	21.80	16.02		21.33	14.67	
Metacog.	4.70	1.19		4.90	1.85	
Soc-em.	5.70	1.23		5.45	1.68	
Voc.	29.46	12.35		32.60	14.62	
R/comp.	30.80	11.11		33.99	16.29	
M/Oper.	43.06	24.12		35.50	17.04	
Prob.	31.59	13.02	61	21.33	14.67	80

Table 2

Canonical Relation Between School Adjustment and Achievement

Grade	Primary				Intermediate			
Function	1	2	3	4	1	2	3	4
Lambda	.456	.733	.986	.996	.596	.769	.951	.993
Correl.	.614	.506	.098	.061	.474	.436	.206	.083
Eigen.	.377	.256	.009	.003	.225	.190	.042	.007
Alpha	.000	.045	.944	.645	.001	.021	.439	.474
P/Read	.42	-.99			-.98	.08		
P/Math	.49	.92			.84	-.61		
Metacog.	.47	.19			-.51	-.99		
Soc-em.	-.04	-.21			.44	.30		
Voc.	.72	-.75			-.49	-.46		
R/comp.	-.60	-.54			-.58	-.34		
M/oper.	.94	.24			.97	-.64		
Prob.	-.27	.63			.13	.27		

w=canonical weight

Table 3

Canonical Relation Between Social Background, School Adjustment, and Achievement

Grade	Primary				Intermediate			
Function	1	2	3	4	1	2	3	4
Lambda	.297	.578	.924	.974	.375	.596	.852	.971
Correl.	.696	.610	.228	.159	.609	.548	.351	.169
Eigen.	.486	.373	.052	.025	.372	.300	.122	.029
Alpha	.001	.108	.979	.927	.000	.015	.476	.833
Resid.	.273				.40	.10		
School	.45				-.38	-.03		
Gender	.04				.38	-.34		
Ethn.	.49				.21	.38		
P/Read	.31				-.14	.96		
P/Math	-.52				.48	-.50		
Metacog.	-.35				.45	.39		
Soc-em.	.11				-.08	-.09		
Voc.	.13				-.13	.73		
R/comp.	.65				.74	.49		
M/Oper.	-.92				.81	-.76		
Prob.	-.19				-.39	-.19		

w=canonical weight

Table 4

Canonical Relation Between Social Background and Adjustment to School

Grade	Primary				Intermediate			
Function	1	2	3	4	1	2	3	4
Lambda	.460	.708	.878	.984	.662	.835	.955	.996
Correl.	.591	.440	.327	.124	.455	.354	.204	.060
Eigen.	.349	.194	.107	.015	.207	.125	.041	.004
Alpha	.000	.024	.127	.350	.015	.147	.499	.600
Resid.	-.48	-.89			.62			
School	-.34	.05			.54			
Gender	-.05	.33			.72			
Ethn.	.88	-.53			.05			
P/Read	-.41	.44			.41			
P/Math	-.57	.07			-.47			
Metacog.	-.30	-.53			.35			
Soc-em.	.38	.96			.62			

w=canonical weight

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